PROJECT INFORMATION MEMORANDUM (PIM)
FOR
APPOINTMENT OF CONCESSIONAIRE ON DESIGN BUILD FINANCE OPERATE AND TRANSFER (DBFOT) WITH 100% CONCESSIONAIRE INVESTMENT ON PPP MODEL FOR THE WORK OF COLLECTION, PRIMARY & SECONDARY TRANSPORTATION OF 500TPD C&D WASTE TO EXISTING PROCESSING PLANT AT CHIKKAJALA FOR A CONCESSION PERIOD OF 15 YEARS

PACKAGE -2

Prepared by

CLIENT

BENGALURU SOLID WASTE MANAGEMENT LIMITED

RITES LTD

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The BSWML Company is formed as per companies act, 2013 is responsible for carrying out business within the jurisdiction of Bangalore Urban District including BBMP for managing various types of waste including Construction and Demolition waste.

In this regard, a comprehensive management plan to handle the Construction and Demolition waste has been prepared and planned to be taken up under PPP model.

DISCLAIMER

A comprehensive Project Information Memorandum (PIM) has been prepared to provide an overview of the existing facilities and the status of C&D Waste Management and handling processes. The information contained herein is condensed for the corresponding package.

It is important to note that the PIM is intended to offer a general understanding of the current situation, and the assessment of such facilities shall be an integral part of the Bidder's or Applicant's responsibility. RITES, as the consultant and author of this document, and BSWML & BBMP, do not assume any liability for deviations from the information provided in this write-up. This document is meant to serve as a reference and initial guide for interested parties, and it is recommended that Bidders or Applicants conduct their due diligence comprehensive assessments to ensure accurate and up-to-date information before participating in any related projects or initiatives.

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GLOSSARY

ABBREVIATIONS	FULL FORM
BBMP	Bruhat Bengaluru Mahanagara Palike
BUA	Bangalore Urban Agglomeration
BUD	Bengaluru Urban District
BSWML	Bengaluru Solid Waste Management Limited
CAPEX	Capital Expenditure
C&T	Collection & Transportation
COD	Commercial Operational Date
CPCB	Central Pollution Control Board
C&D	Construction and Demolition
CPHEEO	Central Public Health and Environmental Engineering Organization
CSR	Corporate Social Responsibility
DPR	Detailed Project Report
DBFOT	Design Built Finance Operate and Transfer
GPS	Global positioning system
GHG	Green House Gases
GoK	Government of Karnataka
GoI	Government of India
GVW	Gross Vehicle Weight
IEC	Information, Education, and Communication
IT	Income Tax
KCDC	Karnataka Compost Development Corporation
KSERC	Karnataka State Electricity Regulatory Commission
MoHUA	Ministry of Housing and Urban Affairs
NGO	Non-Governmental Organizations
O&M	Operation & Maintenance
OPEX	Operational Expenditure
PPP	Public Private Partnership
PMC	Project Management Consultancy
SPCB	State Pollution Control Board
SCT	Secondary Collection and Transportation
TPD	Tonnes per Day

ULB	Urban Local Bodies
UDD	Urban Development Department
UN	United Nations
WMD	Waste Management Department
YoY	Year on Year

1. INTRODUCTION:

1.0 PROJECT INFORMATION

The BSWML acting through and represented by Government of Karnataka and are engaged taking up the scope of services to attain the Garbage Free City (GFC) of Bengaluru by implementing various policies as per the MOU of BSWML. In this connection, BSWML is intend to establish a dedicated mechanism to handle the removal of C&D waste through a scientific Mechanism. To this effect, M/s BSWML appointed M/s RITES Ltd a PSU under Ministry of Railways to prepare inception/Feasibility/ Detailed Project reports to appoint the agency for the Collection and Transportation of the Construction and Demolition (C&D) Waste from various parts of the Bengaluru city. In this context, BSWML advised M/s RITES to take up two independent studies to prepare the detailed projects reports to provide the scientific solution to remove the C&D waste from source of its generation and to eliminate the black spots and to establish the processing plants to process the C&D waste at different parts of the out skirts of the Bengaluru city.

1.1 Scenario-1: Collection, primary transportation and secondary transportation of the C&D waste of about 1750 TPD to the existing processing plants located at Kannuru with processing capacity of 750 TPD and Chikkajala with processing capacity of 1000 TPD.

1.2 Scenario-2: Comprehensive proposal for collection, primary transportation & secondary transportation and processing the same at 4 locations by identifying the land parcels to establish the 4 processing facilities of about 750 TPD at each location.

1.3 Basis for assessment of the C&D Waste:

BSWML supplied the study report prepared by Senior Environmental Officer of KSPCB and has been taken as the basis to assess the quantities generated in Bengaluru city which has been made in more meaningful with four zones of the city and bifurcated the C&D waste in the zones

1.3.1 As per the report the quantity statement is as follows:

(1) North & Northeast zone: 2541.00 TPD
(2) East and Southeast Zone: 2675.00 TPD
(3) West and Southwest Zone: 802.5. TPD
(4) West and Northwest Zone: 696.00 TPD.

1.3.2 it has been ascertained from the operators of the existing plants and noted that there are existing C&D waste processing plants located as one at Kannur with 750 TPD processing capacity established by Private entity and run by collecting the tipping from BBMP to process the C&D waste and Chikkajala with 1000 TPD Capacity established by BBMP and operated by private vendor and there is one more processing plant at Anekal established and operating by private a builder. Though the plants are established to process the C&D waste with designated capacities, and there is huge quantum of C&D waste being generated but the same is not transported to these existing two plants. The plants at Kannur & Chikkajala are located at North and eastern part of the city. The assessed quantity of C&D waste being generated in this part of the city is about 2500 TPD but the minimum required quantity 1750 TPD is getting to the processing plants has become a big challenge to ULB as there is no scientific Collection & Transportation of C&D waste mechanism is established.

1.4 Existing transport mechanism:

The trucks being deployed by private agencies are not meeting any regulations and nor are they carrying to any defined disposal sites or neither disposing at existing plants.

1.4.1 pollution due to existing transportation

The other major setback in continuing to operate with the existing Transport mechanism which results in huge pollution as listed below

1. Pollution caused by Trucks.
2. The disturbed flow of traffic due to truck movement.
3. Un organized transportation
4. Un organized collection

1.4.2 Pollution Load Caused by a 10 Ton Single axle Truck Transporting C&D Waste:

The average mileage of a 10 Ton capacity truck: 4 Kmpl (on actual grounds It shall be about 2 to 3KMPL which is much less than standards) Average distance to be travelled by truck to transport 10 Tons of C & D waste: 60km Fuel required: 15 litres. Carbon dioxide Produced by Burning 15 Litres of Diesel: 15 x 2.62 kg =39.3 kg

1.4.3 IISc Bengaluru conducted a study on pollution due to transport vehicles deployed by private owners to carry the C&D waste and it has been observed that 390 Truckloads of C&D wastes are dumped daily in the dump sites and the majority

are dumped in low-lying areas and crates created by stone quarrying. At a rate of 10 Tonnes per Truck, to transport 1000 TPD, 100 Trips are needed, and this may result in the emission of 4 Tons of Carbon Emissions per day.

1.4.4 Pollution Caused by a 10 Ton Single axle Truck while Transporting C&D Waste as follows:

Average truckloads/day in Bangalore city	390 (as per IISc Report)
Carbon Dioxide produced /truck/ load	40 kg approx./h
Carbon dioxide produced by 390 truckloads	15.6 Tons of Carbon dioxide / day
	i.e., 5694 Tons / year

1.4.5 By considering above and to maintain pollution and dust free city, it is essential to establish a dedicated collection, transportation in scientific mechanism and reduce the CO2 emission

2. JURISDICTION OF PROPOSED PROJECT

2.1. PROJECT AREA INFORMATION:

a) Karnataka State Pollution Control Board (KSPCB) conducted a detailed study and assessed the generation of C&D waste base of the field survey held during 01.01.2020 to 28.06.2021.
b) The study was conducted on each ward under each zone.
c) The nature of the project and detailed out based on the layout development and individual construction
d) The average C&D waste generation for the new construction as per the CPCB norms It shall be 40 to 60 KGs per Sqm of BUA which is average of 50 Kg/Sqm.
e) The nodal officer under his guidance a dedicated team has been established to assess the C&D waste and the calculations based on the team.
f) The summary of the C&D waste generation based of KSPCB assessment

2.2. Overview of the C&D WASTE GENERATION

1. North & Northeast zone: 2541.00 TPD
2. East and Southeast Zone: 2675.00 TPD
3. West and Southwest Zone: 802.5. TPD
4. West and Northwest Zone: 696.00 TPD.

2.3 Action plan proposed

By considering the above assessment, it has been concluded that there is about 6700 TPD of C&D waste is being generating daily on an average but it is not being processed and also not scientifically transported. Hence BSWML has taken up the proposal to establish the comprehensive proposals for Collection & Transportation and Processing of the C&D waste by appointing the Concessionaire to be appointed on Design Build Finance Operate and Transfer (DBFOT) with the 100% investment by the concessionaire towards capital investment and also for the Operating and Maintenance of the infrastructure for C&T and P&D of about 4750 TPD under 7 (seven) slices/ Packages. The revenue to meet the capital investment as well as O&M cost shall be paid by Authority/ client/ BSWML to the concessionaire on tipping fee per Ton as per the terms and conditions and scope of work mentioned in RFP and DCA of the corresponding packages.

2.4 Overview of the Project

From the total available assessed quantity of 6700 TPD, presently about 4750 TPD has been taken up in phase and accordingly the approvals from the competent of client has been obtained to handle the quantity of about 4750 TPD. From the 4750 TPD of C&D waste, the subject package size is of 500 TPD is proposed to collect the C&D waste and stored in 5.00 Cum capacity containers/bins at the source generation points from the corresponding jurisdiction of the proposed Package and transport the same through primary transportation with 7.50 T GVW vehicles or equivalent capacity hook loader from the collection points and then transport to the transfer stations and transfer the same from the small containers of about 5.00 Cum containers to the large size containers of about 20.00 Cum containers at the transfer stations. The large size containers after filled up to the maximum capacity, then the same large containers are proposed to be lifted by hook loaders of 28.0 T GVW capacity which shall carry these 20.00 Cum containers to corresponding processing plant. The jurisdiction of the collection of the C&D waste is identified and a jurisdiction map is attached at annexure to the PIM report.

3. THE SALIENT FEATURES OF THE C&D WASTE MANAGEMENT

Description of the Service	Unit	Quantity
Package-2: "Design Build Finance Operate and Transfer (DBFOT) with 100% Concessionaire Investment on PPP model for the works of Collection, Primary Transportation & Secondary Transportation of 500 TPD C&D Waste to the Existing Processing plant at Chikkajala as per Scope of work of PIM document, RFP document and the T&C in Concession Agreement, C&D Waste Management Rules 2016; SBM-2.0, CPHEEO Manual and any other amendments to such rules and guidelines during the concession period of 15 years of O&M which is after the COD.	**Tons per day (TPD)**	**500**

3.1 Aims & Objectives of the project:

The Collection of C&D waste and stored in 5.00 cum containers by deploying mechanical equipment's/ manual lifting as is case from source generation spots, then Primary transportation using 7.5 T GVW Hook loaders to the designated Transfer stations of each package. Further, the waste collected in 5.0 cum containers is transferred into large size 20.00 Cum containers at transfer stations and Secondary Transportation from the transfer stations using 28.00 T GVW hook loaders by carrying these 20.00 Cum containers to the C&D Waste processing facilities.

a. Waste management techniques to collect and transport to the processing facility in ways that are Environmentally, Financially and Socially Sustainable.
b. Based on Waste hierarchy (Reduction > Reuse > Recycling >Recovery >Disposal).
c. Collaboration of all stakeholders.
d. BS-vi vehicles proposed to deploy to reduce the air pollution
e. IEC activities
f. Mobile Tracking Management through RFID /GPS mechanism to monitor the weight and trip and distance through advanced software's connecting to the ICCC with call Centre to citizens to connect the mechanism.

4. SCOPE OF WORK

The scope of work is divided into following sections and sub sections

4.1 Section-1: Collection & Transportation:

4.1.1 Sub-Section-1: Collection: The concessionaire shall procure the optimum required number of containers of 5.00 Cum capacity along with suitable hook loaders to carry these containers. Deploy the minimum required labour at each C&D Waste collection spot to fill the containers. The filled containers need to be taken by hook loader with in stipulated time mentioned in RFP and DCA. The minimum required containers to be deployed based on the assessment of the available quantity at source.

4.1.2 Sub-Section-2: Primary Transportation: The filled containers from C&D waste generation points shall be carried by the optimum capacity of the hook loaders to be deployed and carry the filled containers to the transfer stations. The small size containers shall be transferred the waste into the larger size of 20.00 Cum or more capacity containers at the transfer stations.

4.1.3 Sub Section-3: Secondary Transportation: The secondary transportation through the hook loader of 28.00 T GVW or more capacity to be deployed to carry the filled larger size containers from the transfer station to processing plant.

4.2 Section-2: Administrative activities:

4.2.1 Sub Section-1: GPS/RFID/Mobile tracking mechanism: The concessionaire has to establish the comprehensive RFID/ GPS mechanism to containers, hook loaders and weigh bridges along with CCTV and connect the entire vehicle tracking mechanism and loading assessment mechanism to the central control command system of BSWML and monitor the same

4.2.2 Sub Section-2: Information, Education and Communication (IEC) activities: Deploy the minimum required expert teams and promote the activities through social media to establish the IEC system and create the awareness programs among the citizens and make them to be part of the SBM-2.0 as per the guidelines. Establish the call centre to attend the public redressal and complaint resolving mechanism as per the guidelines of SWM 2016 rules or any rules prevailing to attend the complaints as per the DCA clauses

4.2.3 **Sub section-3**: Infrastructure & facilities: Establish the Vehicle washing system, Workshops to maintain the vehicles, fuel stations, public utilities for the staff and workers deploy the minimum required staff for each activity

and maintain the proper records of the deployment of the vehicles, manpower etc.

4.3 The detailed scope of work is as follows:

4.3.1 It shall be proposed that a comprehensive plan shall be prepared in consultation with agency who is going to be appointed the BSWML should prepare comprehensive C&D Waste Management Plan, covering storage, collection and transportation to existing processing plants and further process the same at 2 locations with 750 TPD & 1000 TPD at each location of each package.

4.3.2 It has to be noted that Ministry of Environment, Forest & Climate Change has published notification on 29.07.2024 for Construction & Demolition Rules, 2024 which shall be into effect from 1st April, 2025. Till then Construction & Demolition Rules, 2016 shall be effective.

4.3.3 The Comprehensive Plan shall indicate for the collection, storage, containment, transportation of all claimed & unclaimed C&D waste to the facility for its further processing and disposal.

4.3.4 The contractor will be responsible for lifting unclaimed waste from areas, as directed by BSWML officials, which otherwise cause nuisance to vehicular traffic, mainly on both sides of the roads and at junction points. The heaps of C&D waste dumped by road side/isolated, is to be cleared by the contractor. The unauthorized dumping needs to stop within the stipulated time mentioned in DCA and its articles.

4.3.5 Set a common call centre facility in consultation with the Contractor selected for other slice and GPS based, Android& iOS based interactive Mobile Application for easy access of C&D waste facility for the user (8 am to 8 pm during 365 days) for registering a request for collection from BSWML and private parties. Contractor should attend all the sites within 48 hours. The mechanism for surveillance of C&D waste in order to avoid the duplication of waste collected & disposal should be implemented by the contractor. The same will be integrated with BSWML control command centre.

4.3.6 The responsibility of the contractor includes providing adequate number and types of vehicles of make Tata / Ashok Leyland / Eicher / Hyva or any other equivalent for collection and transportation. These vehicles shall be in compliance with RTO rules/ regulations and all other applicable rules & regulations/ notifications by competent Authority.

4.3.7 Install GPS in all vehicles at its own cost and provide MIS data to BSWML on a monthly basis and whenever required by BSWML intermittently.

4.3.8 Provide all the MIS Data of the project to BSWML along with a monthly bill as approved by BSWML at the time of execution of project.

4.3.9 For less than 1 MT of C&D Waste generator i.e. Small Generator who has not registered with BSWML and their payment is not reflected in ESCROW account, in such case the Contractor has to provide service with small size containers after registering the requirement of the removal of such waste for less than 1 MT C&D Waste after confirmation of payment receipt paid to BSWML.

4.3.10 For generators of C&D waste equal or more than 1 MT & less than 20 MT i.e., Medium Generators, who have not registered and their payment is not reflected in ESCROW Account, then such cases need to be brought to the notice through online tracking mechanism and Concessionaire shall provide the containers to source generation spots after register their request and after confirmation of the payment in ESCROW account.

4.3.11 For BSWML's other civil works / bulk generators having quantity equal or more than 20 MT per day or 300 MT per project per month there will be two cases as mentioned below. The C&D waste supplied by bulk waste generators are required to take the processed materials to their upcoming projects at the rates applicable as per the local SR rates.

a. The concessionaire has to enter into an MOU with the Bulk waste generators in consultation with authority to handle the bulk waste. The signed copy between the parties need to submitted to authority.
b. In case the bulk generator uses BSWML's Collection and Transportation services then the Contractor for this project will make arrangement for Collection, Transportation, and in case of Processing & Disposal (if applicable) of C&D waste from bulk generators. Bulk generator will make payment to concessionaire directly per the rates approved by BSWML.
c. In case the bulk generator transports the waste directly to the processing plants site on his own cost then the Bulk generator shall seek prior approvals for the accepted transport mechanism being accepted by BSWML and bulk generator has to pay the fee towards the processing fee to the processing plant agency as per the rates

approved by BSWML. The amendment to the existing rules if any to this extent shall be made and informed to concessionaire and BWGs.

d. In case of other than the BWGs, if there is a difference between quantity registered and payment made in ESCROW account and actual C&D Waste found on the site, then Contractor shall inform BSWML, in cases the subsequent confirmation for additional quantity based on the online GPS tracking mechanism then the contractor shall collect the C&D. however the actual quantities shall be ascertained through online GPS tracking mechanism and the cross verification shall be carried out through the independent agency appointed by BSWML.

4.3.12 For unclaimed debris in any ward, the contractor in the presence of BSWML's staff will take minimum Two (2) Geo-Tagged photographs of the C&D Waste Pile from different angles, which will mention its date, time and location before and after collecting the waste. Two (2) Geo-Tagged photographs each, before and after collecting the C&D Waste, shall be uploaded on the mobile application/ system and shall be submitted along with the monthly bill. Payment of unclaimed debris shall be made by BSWML as per the record. Contractor has to install suitable weight calculation mechanism through online tracking system on all the vehicles and containers deployed for the project. Specific weight at every spot of claimed and unclaimed C & D Waste shall be recorded, and the contractor shall make the needful arrangement.

4.3.13 Facility for "on-demand/ on-call pickup" of C&D from claimed C&D waste generators needs to be created by the contractor.

4.3.14 The Contractor has to market and promote its services for lifting of claimed C&D waste.

4.3.15 Give methodology of collection & transportation C & D waste which should include collection from zone, ward, complain based collection, request based collection system utilising the vehicles as mentioned.

4.3.16 Proper transportation permits should be obtained and the agency shall have the necessary permits.

4.3.17 The Bidder has to dispose of the inerts at the suitable location and appropriate manner as per the methodology and rules of the receiving area and with approvals from competent authority.

4.3.18 The Bidder has to provide Uniforms, Fluorescent Jacket and other Safety Gear as per C&D Waste Management Rules 2016 to its operating staff.

4.3.19 The Bidder has to provide an adequate number of Supervisory staff with conveyance for mobility and communication tools for effective co-ordination of the system.

4.3.20 The Bidder has to specifically procure the assets for the C&D waste purpose and all the assets would be painted with specific colour code and number and name written on it as per direction from BSWML officials. After the compliance only the vehicles would be allowed to operate.

4.3.21 The operation involves various movements of vehicles for maintenance, transportation of vehicles from collection point to Plant site, processing of the C&D Waste and produce recycled materials, movement of vehicles from plant site to disposal site.

4.3.22 The successful Bidder has to provide registration number of their vehicles to BSWML prior to start of the operation. BSWML may direct the Contractor to get audited any of the software/ GPS system/ VTMS system used for the project from the authorized agencies acceptable to BSWML at any time during the contract period.

4.3.23 The successful Bidder has to establish control room, workshop on the processing plant site itself.

4.3.24 The contractor shall undertake a mass awareness program, in their respective slice, so as to ensure that C&D waste being generated in its contract area is not being littered along the road side or disposed-off at existing MSW dump site(s).

4.3.25 The contractor shall carry out awareness, capacity building and ICE activities.

4.3.26 The contractor shall create a sustained system of information, education and communication for construction and demolition waste through collaborations with expert institutions and civil societies and also disseminate through their own website.

4.3.27 The contractor should keep a track of the generation of construction and demolition waste within the BSWML limits and establish a database and update on a regular basis in-order to optimize its processing facility.

4.3.28 The contractor shall coordinate with the BSWML periodically to understand the C & D waste generation.

4.3.29 The contractor will involve community participation and discuss with the citizen community in order to ensure a free flow of information on waste generated by individuals so as to optimize the collection, transportation, Processing and Management Facility.

4.3.30 The successful Bidder shall compulsorily install Vehicle Tracking Management System (VTMS) on each vehicle used for collection & transportation of C&D waste and disposal of post processing rejects, with the necessary web based software, accessible from web, personal computer/ laptops, network links, antivirus, printer, GPS / Sim Card / Dongle and shall provide necessary training to the Municipal Staff and connect the system with Municipal server through IT department of BSWML with loading / unloading switch for vehicles transporting C&D waste/ post-processing rejects at their own cost. Please note that for payment of tipping fee, VTMS record is mandatory.

4.3.31 The successful Bidder to provide Vehicle Tracking Management System (VTMS) including complete client site connectivity at different locations, Weighbridge etc. The system must be a web-based application including GPS based live tracking with GIS mapping and integrated map. The successful Bidder must provide all necessary hardware (e.g. Computers, GPS etc.) and necessary connectivity with BSWML server. The successful Bidder to comply with server requirements of BSWML.

4.3.32 The successful Bidder shall have to provide a separate set of vehicles with VTMS installed and connected to BSWML Server for this project.

4.3.33 GPS System shall be installed / fixed / provided in each vehicle deployed under this project for collection & transportation of C&D waste and shall be in working conditions always. Feed from these GPS will be integrated with BSWML websites.

4.3.34 The successful Bidder shall provide the real time feed / monitoring of GPS System through Web based Technology and integrated to BSWML portal.

4.3.35 The successful Bidder shall collect, transport & dispose the waste generated as per the proposal, if it is less or more than indicated in contract then in such case the concessionaire shall be dealt to account the same as per the accepted rate per ton and the contractor is bond to follow the same as per the instruction of authority.

4.3.36 Before commencement of services under this project, the contractor shall submit detail work plan for collection, transportation, processing & disposal of C & D waste and get it approved from BSWML. This plan may be amended in future as per the project requirement; however such amendment will require prior approval of BSWML.

4.3.37 Collection of municipal Solid Waste and Bio-medical Waste is not within the purview of this Project and it is supposed to be handled as per SWM

Rules 2016 and Biomedical Waste – Management & Handling Rules. The Successful Bidder is therefore under no obligation to collect, transport, treat, or dispose of Municipal Solid Waste and Bio-medical waste. However, in the event of finding Municipal Solid Waste and or Bio-medical waste disposed of unscientifically alongside C&D Waste or mixed with C&D Waste, in the wards covered in Complete Sanitation or Partial Sanitation, the Contractor shall notify the same to BSWML. The Contractor shall not take such waste to the C&D Waste Processing Facility as it may contaminate other products derived from the Waste.

5.0 Service level benchmarking:

5.1 The Contractor shall achieve Collection, Transportation from Commercial Operation Date in the following manner.

Sl. No	Period	Benchmark
1.	By Six Months from Commercial operation Date	75%
2.	By Twelve Months from commercial and operations date	100%

Table 1: Service Level Benchmarking

5.2 The operational hours of collection & Transportation in two tasks

a. task-1 Primary Transportation

5.00AM to 9.00AM
7.00PM to 11.00PM
} 7500 Kg GVW (for primary collection & transportation)

b. Task-2: Secondary Transportation

5.00AM to 9.00AM
10.00PM to 2.00AM
} 28000 Kg GVW (secondary transportation)

5.3 Transportation Mechanism:

i. Collection of C&D waste from source by deploying the containers of 5.0 Cum capacity
ii. Primary transportation with 7.5T GVW or equivalent capacity with hook load mechanism.

iii. Secondary collection with 20.0 Cum containers
iv. Secondary transportation: with 28.0 T GVW vehicles with hook loading mechanism.
v. All transport infrastructure must have minimum of additional 10 % of the total required quantities towards break down and O&M requirements
vi. The concessionaire shall be required to procure 100% of the required collection bins/ Containers to meet the collection of the C&D waste and transport vehicles with hook loading system can be assed based on the requirements such as number of trips a hook loader can make in ideal condition for the primary and secondary transportation and accordingly the manpower and infrastructure may be ascertained.

6.0 Machinery & Manpower:

6.1 Depending on the requirement, the successful Bidder shall deploy adequate resources in each ward and ensure that 100% C&D waste is collected as required under this project and no C&D waste is left unattended & lying on roadside or any other open space.

6.2 Mechanized lifting & collection of C&D waste shall be done to the extent possible so that there shall be minimum physical handling of C&D waste (ideally zero). For mechanized lifting auto tippers/hook lifts/dumper placers or suitable mechanism can be used.

6.3 Minimum capacity of Hook Loaders/Tippers/Trucks shall be of 7.50 T GVW for primary collection and 28.00 T GVW shall be for secondary transportation

7.0 Print media:

The entire concept of proper handling and disposal of C&D waste, including information about the designated C&D waste collection points and the uses of recycled C&D waste materials, toll free helpline number for on-demand lifting of C&D waste should be conveyed through posters, brochures, pamphlets given to each house or commercial establishment and can be displayed in prominent positions as well as local newspapers in consultation with BSWML.

8.0 Electronic media:

Local cable television channels, radio, websites shall be used by Contractor to inform citizens about the toll-free helpline numbers facilitating on-demand C&D waste collection, new C&D waste collection arrangements and advertise contact numbers of officials to call for problem solving or for reporting grievances relating to unauthorized dumping and non-removal of C&D waste.

9.0 Internal Performance Monitoring:

The Contractor shall propose Internal Performance Monitoring mechanism for effectiveness in project implementation covering all areas of service delivery including efficient redressal of complaints, and monitoring the performance of workforce etc.

10.0 Contract Period:

The contract period shall be 15 years from the commercial operation date (COD). The following phases for the execution of the project are as follows-

10.1 Phase I – Mobilization Period**:**1 month from the date of receipt of letter of acceptance or from the date of handing over of the facilities, whichever is later. Mobilization period includes time to **start the process to** obtain all the necessary clearances & approvals from relevant authorities and **place orders to** deploy vehicle and manpower for collection & transportation mechanism. If the delay is beyond the control of the concessionaire, then the mobilization period shall be extended based on the reasons recorded and in such recorded hindrances justified by the engineers in charge or the authorised representative of BSWML.

10.2 Phase II –Construction Period- Eighteen Months for the establishment of the processing facilities, civil infrastructure etc in case of the processing facilities are to be established or otherwise 12 months to complete the procurement process of the vehicle.

10.2.1 Collection & Transportation vehicles through procurement/ hiring/ owned within 12 months from the date of LOA and same should be in staggered manner. At least 50% of the total vehicles shall be required to be deployed within 6 months from the date of LOA and balance 50 % with 12 months from the date of LOA. In case of delay due to unforeseen circumstances, the period may be extended with prior approval of Authority.

11.0 Permits & Clearances:

11.1 Permits and **clearance** shall be obtained as per Applicable Law which includes but not limited to C&D Waste Management Rules 2016, The Environment Protection Act 1986, The Air (Prevention and Control) Pollution Act 1981 and Water (Prevention and Control) Pollution Act1974 as amended from time to time and If any statement requirements specified by MOEF, CC, MOHUA, NITIAAYOG, CPCB and KSPCB.

11.2 The projects relating to C&D Waste may require a number of clearances including but not limited to the following:

1. Prior Environmental Clearance.
2. Clearance from Airport Authority of India (if the Landfill Facility is within 20 Kms from the airport).
3. Clearance from Development Authority.
4. Traffic Police clearance for vehicular movement in the city Or
5. If any other requirements specified by MOEF&CC, MOHUA, NITIAAYOG, CPCB and KSPCB.

11.3 The Contractor shall be solely responsible for taking various statutory and non-statutory clearances for the Project from all concerned authorities. The Authority may assist the Contractor in procuring the clearances required for the Project.

11.4 This being a green initiative, may be entitled to Carbon Credits. The Contractor may be required to apply for availing the carbon credits, and can avail the same. If credits are generated, they will be shared in 70% (Concessionaire) to 30% (BSWML)

12.0 The Contractor shall have the liberty to upscale the technology during the Contract Period with the prior approval of the Authority and clearance from the State Pollution Control Board for deriving larger benefits without causing any harm to the neighbourhood, health and environment of the City and without putting any additional burden on the Authority.

13.0 The Contractor shall have to follow all the directions contained in the C&D Waste Rules as well as State Laws and Rules or any other applicable rules/ regulations/ guidelines as amended from time to time. In the event of any major change in the legal frame work in the Country or the State, necessitating a major change in the C&D Waste management Facility towards collection transportation need to be adhered and follow such change in rules and policies.

14.0 Facility duly created by the Contractor following the present law and the Rules, he shall, on being asked by the Authority, comply with the new laws and the Rules at his cost and may ask for reasonable compensation which shall be determined by a technical committee that may be appointed by Government/ Authority.

15.0 The Contractor shall use vehicles; equipment and machinery which meet the standard emission norms prescribed by the manufacturer/ the competent authority from time to time and adhered to the rules and regulation set by the statutory bodies towards Operation and maintenance of infrastructure and equipment's.

16.0 Operation and maintenance of infrastructure and equipment:

The successful Bidder shall be responsible for construction, operation and maintenance of tipper trucks, mechanical lifting arrangement to transfer the waste from bin into tipper truck, required infrastructure including treatment units [crushers and separators] etc. parking facilities, weighbridge, hook loaders.

17.0 Dust Control Plan: Suitable measures as mentioned in various rulings of the Hon'ble Supreme Court of India and Hon'ble NGT for controlling the dust-based pollution shall be taken by the Concessionaire to control and manage the dust generated during transportation of C&D Waste and ensure that dust generation is minimal even during the dry seasons. Concessionaire will ensure all dust control measures in designated collection points also. Further, the agency will ensure all dust control norms in designated collection points and plant as per C&D Waste Management Rules 2016 or the applicable rules of the land use. Concessionaire shall also follow the latest dust control norms as applicable till the concession period. Adequate number of anti-smog guns shall be provided by the concessionaire. A Digital display to monitor the pollution / dust will also be provided by Concessionaire.

17.1 Effective implementation of C&D waste collection & storage at source by all waste generators, and at all levels and scales shall be established & transportation of the same shall be provided.

17.2 Open dumping of C&D waste is prevented with strict rules.

17.3 The concessionaire must ensure the health, safety and dignity of every person and stakeholder involved in handling C&D waste in all respects.

5. PROJECT COST

S.No	Name of the package	Capital cost in Crores	O&M Cost of the project for 15 years amount in Crores
1	Package-2: APPOINTMENT OF CONCESSIONAIRE ON DESIGN BUILD FINANCE OPERATE AND TRANSFER (DBFOT) WITH 100% CONCESSIONAIRE INVESTMENT ON PPP MODEL FOR THE WORK OF COLLECTION, PRIMARY & SECONDARY TRANSPORTATION OF 500TPD C&D WASTE TO EXISTING PROCESSING PLANT AT CHIKKAJALA FOR A CONCESSION PERIOD OF 15 YEARS	13.80	207.92

Table 2 Project Cost

6. ASSESSMENT OF VEHICLES

6.1 VEHICLES FOR PRIMARY TRANSPORTATION:

Package	Description of the component	Assessed Quantity
Package 2 (500 TPD): APPOINTMENT OF CONCESSIONAIRE ON DESIGN BUILD FINANCE OPERATE AND TRANSFER (DBFOT) WITH 100% CONCESSIONAIRE INVESTMENT ON PPP MODEL FOR THE WORK OF COLLECTION, PRIMARY & SECONDARY TRANSPORTATION OF 500TPD C&D WASTE TO EXISTING PROCESSING PLANT AT CHIKKAJALA FOR A CONCESSION PERIOD OF 15 YEARS	5.00 Cum Container	154
	7.5 T GVW Hook Loader	12

6.2 SECONDARY TRANSPORTATION:

Package	Description of the component	Assessed Quantity
Package 2 (500 TPD): APPOINTMENT OF CONCESSIONAIRE ON DESIGN BUILD FINANCE OPERATE AND TRANSFER (DBFOT) WITH 100% CONCESSIONAIRE INVESTMENT ON PPP MODEL FOR THE WORK OF COLLECTION, PRIMARY & SECONDARY TRANSPORTATION OF 500TPD C&D WASTE TO EXISTING PROCESSING PLANT AT CHIKKAJALA FOR A CONCESSION PERIOD OF 15 YEARS	20.00 Cum Container	39
	28 T GVW Hook Loader	11
	Transfer stations	3

7. TIPPING FEE

The tipping fee is established through a comprehensive analysis of several factors, such as operational costs & associated expenses. This fee is designed to ensure that all operational costs and expenses are adequately covered for the following items.

Factors to be taken into consideration for the tipping fee

1. Deployment of the containers of 5.00 Cum capacity each to store the total C&D waste of 500 TPD of package
2. Lifting the waste from the source generation spots by either through manual lift or mechanical lift.
3. Primary transportation vehicles with hook load system to carry the 5.00 Capacity containers.
4. Supply and establishment of backend software, Mobile app, GPS based vehicle tracking devices and transfer station solutions to by supplying computers, UPS back up, long range RFID reader, Weigh bridge integration unit, transfer station application, CCTV Cameras and uninterrupted Wi-fi network etc.
5. Vehicle washing sheds and maintenance yard.
6. Administrative offices with required facilities
7. Secondary collection containers of minimum 20.00 Cum capacity
8. Secondary transportation vehicles with hook loading mechanism to carry 20.00 Cum or above capacity containers.
9. Primary collection trip distance of 5.00 Kms one directions
10. Secondary transportation of 25.0 Kms of Average distance of one direction

8. SUMMARY OF THE FINANCIAL MODEL

IRR: 13.50%
EIRR: 14.20%
Pay-back period: 7.1th year

9. CONCLUSIONS

1. Appoint the Concessionaire for a concessionaire period of 15 years on PPP model with 100% Concessionaire investment on capital cost of Rs. 13.80 Crores and O&M cost of Rs. 207.92 Crores for 15 years by the Bidder
2. The BSWML shall establish the Escrow account and collect the cess from the construction activities through BESCOM based on per sq.km. based on per sqm. Basis of plan section for modification /alteration/ renovation/new construction activities.
3. The tipping from bulk waste generators shall be collected by concessionaire directly through an MOU before start of the collection, transportation of the waste from bulk waste generators with a prior intimation to BSWML. Government shall issue directions to Bulk waste generators to this effect through a separate gazette.

10. LIST OF ANNEXURES

Annexure 1: Route Map for vehicle movement from Transfer Stations to Processing Plant

Package – 2 – 500 TPD (Chikkajala)

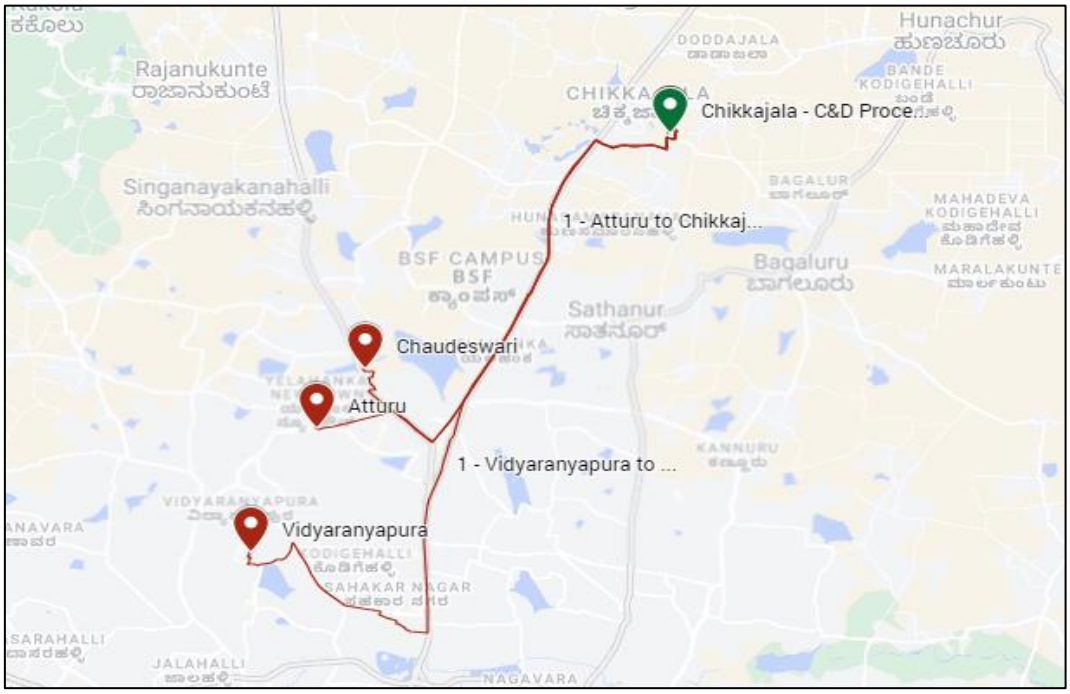

Figure 1 Route Map for vehicle Movement from Transfer station to Processing Plant

Transfer Station	Ward No	Zone	Ward Names	Area in Sq.m	Reserve for	Distance to processing Facility (In Km) (as per Google Route map)	C& D Waste Processing Facility
1	2	Yelahanka	Chaudeswari	1835 sqm	For Public Use	13.8	Package - 2 - Chikkajala - 500 TPD
2	3	Yelahanka	Atturu	3627 sqm	For Public Use	13.8	Package - 2 - Chikkajala - 500 TPD
3	9	Yelahanka	Vidyaranyapura	2150 sqm	For Public Use	21.1	Package - 2 - Chikkajala - 500 TPD
The overall Average distance (in Km) Coverage from all transfer station to Processing Facility is **16 Km**							

Table 3 Proposed Location for 500TPD Processing Facility -Package-2

Annexure– 2: Layout Plan for Transfer Station

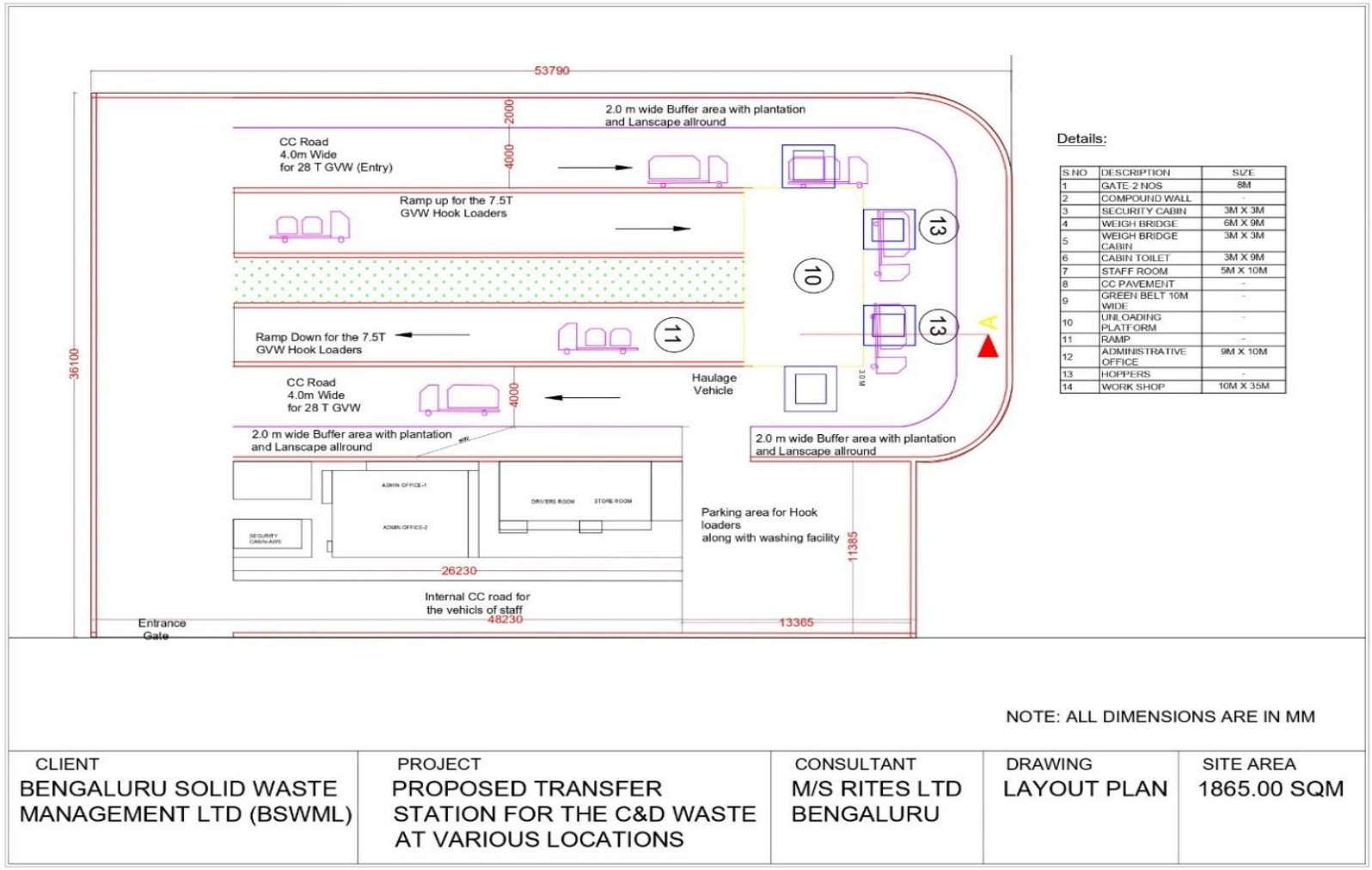
53790
36100
2000
4000
2.0 m wide Buffer area with plantation and Lanscape allround
CC Road 4.0m Wide for 28 T GVW (Entry)
Ramp up for the 7.5T GVW Hook Loaders
Ramp Down for the 7.5T GVW Hook Loaders
CC Road 4.0m Wide for 28 T GVW
Haulage Vehicle
10
11
13
13
A
2.0 m wide Buffer area with plantation and Lanscape allround
2.0 m wide Buffer area with plantation and Lanscape allround
ADMIN OFFICE-1
ADMIN OFFICE-2
DRIVERS ROOM
STORE ROOM
SECURITY CABIN-A/P2
26230
Parking area for Hook loaders along with washing facility
11385
Internal CC road for the vehicls of staff
Entrance Gate
48230
13365
Details:
S NO | DESCRIPTION | SIZE
1 | GATE-2 NOS | 8M
2 | COMPOUND WALL | -
3 | SECURITY CABIN | 3M X 3M
4 | WEIGH BRIDGE | 6M X 9M
5 | WEIGH BRIDGE CABIN | 3M X 3M
6 | CABIN TOILET | 3M X 9M
7 | STAFF ROOM | 5M X 10M
8 | CC PAVEMENT | -
9 | GREEN BELT 10M WIDE | -
10 | UNLOADING PLATFORM | -
11 | RAMP | -
12 | ADMINISTRATIVE OFFICE | 9M X 10M
13 | HOPPERS | -
14 | WORK SHOP | 10M X 35M
NOTE: ALL DIMENSIONS ARE IN MM
CLIENT
BENGALURU SOLID WASTE MANAGEMENT LTD (BSWML)
PROJECT
PROPOSED TRANSFER STATION FOR THE C&D WASTE AT VARIOUS LOCATIONS
CONSULTANT
M/S RITES LTD BENGALURU
DRAWING
LAYOUT PLAN
SITE AREA
1865.00 SQM

Figure 2 Showing Layout Plan-1

Annexure– 3: C&D Waste Materials Checklist

The following checklist template will be useful when planning to salvage, reuse and recycle demolition materials

Demolition Materials	Comments and Concerns
Air conditioning equipment 1. Computer room packages 2. Mini central systems 3. Window units	CFC
Aluminium: Handrails, other Appliances, white goods	Testing, removal
Asbestos Containing Materials: Insulation, floor and ceiling tile, floor and wall coverings, roofing felt and shingles, wall board, siding, ductwork, adhesives, caulking, putties, taping and speckling compounds.	
Asphalt: Paving Asphalt: Shingles Batteries	
Brass Brick Bronze Cabinets	
Cable: Various Cardboard	
Carpet, padding and backing Cast iron: Radiators, pipes, other Clay tile blocks	
Compressors	
Concrete masonry units Decking: Wood	
Door frames: 1. Wood, metal 2. Heavy vault 3. Thin panel and various Wood, Metal	Non-rated
Ductwork Earth	
Electric switchgear, feeder cables, conduit	
Electrical: Cable, Elevator cabs, machinery, shaft equipment, rails Fabric	PCB
Fiberglass	
Fire suppression equipment Fixtures & fittings: Plumbing Fixtures: Electrical	
Flooring: Carpet Flooring, Wood Fuel storage tanks	
Furniture: Wood, Metal Furniture: Reusable Furniture	Can be re-manufactured

Glass: Interior and exterior, Plate, Wired, laminated	
Glazing compound: Asbestos, lead possible Testing Gutters and flashing	Testing
Gypsum blocks Gypsum board	
Hardwood Hazardous materials Heavy timbers	ACBM
Insulation	
Light fixtures: Decorative, Fluorescent and utility fixtures, Vintage fluorescent, incandescent, Lamps: Fluorescent	Mercury retrieval
Lead: Paint, Roofing, Flashing, Piping Light bulbs	Testing, removal
Marble: Toilet partitions, Walls	
Metal: Brass, Bronze, Cable, Cast-iron, Conduit, Copper	PCB Ballasts
Partitions, demountable panels Partitions: aluminium tracks, miscellaneous framing	
Mirrors	
Paper	

Annexure-4: Volume to Weight Conversion

Materials:	Volume *	Weight in Pounds *
MIXED MUNICIPAL SOLID WASTE (MSW)		
MSW, (uncompacted)	One cubic yard	150-300 (225 Average)
MSW, (compacted in truck)	One cubic yard	500-1,000
MSW, compacted in packer truck	3.3 cubic yards	2000 (Average)
C & D; Clean Fill		
Concrete	One cubic yard	860
Asphalt Paving	One cubic yard	773
Brick, Ceramic, Porcelain	One cubic yard	860
Roofing	One cubic yard	731
Wood	One cubic yard	169

Annexure-5: Specifications of typical containers to be used for storing C&D WASTE

	Model	
Container Specification	Hook Loader	Dumper Placer
Container Type	Closed	Closed
Volume (m3)#	9 & 12-16	1.5*, 2.5-3.5**, 4.5-5***
Material Of Construction	Commercial Mild Steel of Appropriate IS specification (Not less than 3mm for walls/sides and not less than 4mm for floor/bottom)	
Recommended Chassis	16-25 T GVW	7*, 9**, 12*** T GVW
Lifting Arrangement	Rear lifting	Rear lifting

#Dimensions of the containers to adhere to the RTO norms. Total loading not to exceed 25 tonnes GVW. The containers shall have an integral securement system to ensure that the rear end of the container is well secured with the vehicle chassis.

Annexure- 6: Illustrative Pictures of Different Containers & Vehicles

Typical Containers

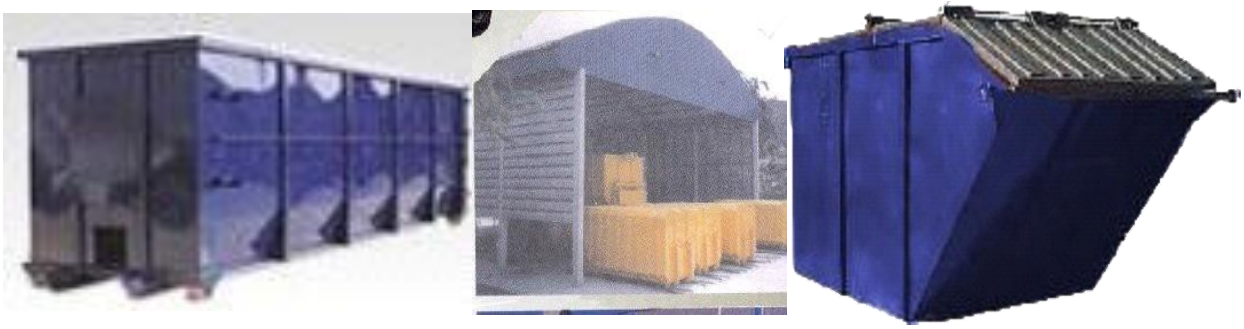

Figure 3 Typical Container

Typical Hook Lifts

Figure 4 Typical Hook Lifts

Typical Dumper Placers

Figure 5 Typical Drum Placer

Annexure- 7: Approximate Number of Vehicles to be deployed

Item	Description of the component	Approximate number of Vehicles to be deployed
Primary Transportation	7.5 T GVW or equivalent Hook Loaders/Tippers/Trucks	12

Item	Description of the component	Approximate number of Vehicles to be deployed
Secondary Transportation	28 T GVW or equivalent Hook Loader/Tippers/Trucks	11